

Learning Analytics in theory and practice

(Guest Editorial)

Analytics is a topic of growing interest in the research communities. INFORMS defined analytics as the scientific process of transforming data into insights with the purpose of making better decisions (Sharda, Delen and Turban, 2018). Being grounded on the area of decision support systems, the area of analytics has got a vast range of applications. One important application concerns educational environments, where the three types of analytics, namely, descriptive, predictive, and prescriptive are being applied. Descriptive analytics is concerned with what happen and why did it happen, prescriptive analytics is concerned with what will happen, and prescriptive analytics is concerned with the best course of action. Some authors consider four types of analytics, splitting descriptive analytics into descriptive analytics, concerned with what happened, and diagnostics analytics, concerned with why did it happen (Slade and Tait, 2019).

Nowadays, the term Learning Analytics forms a field on its own and is applied in the context of the use of Analytics in e-Learning environments. Learning Analytics is vastly used in order to improve quality. It uses data about students and their activities in order to provide better understanding and to improve students' learning as well as its learning environment (Ferguson, 2012; Siemens, 2013). The use of LMS, where the activity of the students' can be easily accessed, potentiated the use of Learning Analytics to understand their route during the learning process, thus they can be helped to improve during that process (Siemens, 2013; Wilson *et al.*, 2017). A competent use of Learning Analytics can help students being aware of their progress, thus it can enable students taking control of their own learning. Another important use of Learning Analytics relates to the detection of situations where the students can give up of the course before its completion.

Learning Analytics poses several important challenges to higher education institutions, namely regarding the organizational capacity of the institutions as well as politic concerns, including also challenges related to pedagogical and curricula matters (Ferguson, 2012; Greller and Drachsler, 2012; Siemens, 2013; Wong, Lavrencic and Khosravi, 2017; Zilvinskis, Willis and Borden, 2017). Another important focus concerns ethical issues related to the use of the necessary students' data. Concerning this last aspect, the international council for open and distance education produced the report "Global guidelines: ethics in Learning Analytics" (Slade and Tait, 2019). In this report, are presented ten universal core issues to be considered when learning analytics are implemented or in development. These core issues include data ownership and control, transparency, accessibility of data, validity and reliability of data, institutional responsibility and obligation to act, communications (with students and with staff), cultural values, inclusion, consent (the several dimensions of), and students' agency and responsibility.

The articles selected for this special issue show the theoretical perspective as well as the effects of Learning Analytics applications in learning and teaching, presenting technology infrastructures with new insights and management perspectives. In particular, focusing on a project, the work done on learning analytics in a country such as France is reported. The role of online social networking tool is used in examining connectivism theory applied to English language learning. Details are reported of a study of knowledge management systems

processes and technology in open and distance education in higher education. A perspective with Classical Test Theory and Item Response Theory has been applied to using learning analytics in evaluating the quality of multiple-choice questions. Consideration is given to the question of how we start to approach learning analytics adoption in higher education as well as defining a point of reference for privacy engineering for learning analytics in a global market.

J. Uhomoibhi
A. Azevedo
J. Azevedo
E. Ossiannilsson

May 2019

References:

- Ferguson, R. (2012) 'Learning analytics: drivers, developments and challenges', *International Journal of Technology Enhanced Learning*, 4(5/6), p. 304. doi: 10.1504/IJTEL.2012.051816.
- Greller, W. and Drachsler, H. (2012) 'Translating Learning into Numbers: A Generic Framework for Learning Analytics Multimodal Learning Analytics for Collaborative Learning Understanding and Support View project', (June 2014). Available at: <http://groups.google.com/group/learninganalytics>.
- Sharda, R., Delen, D. and Turban, E. (2018) *Business Intelligence, Analytics, and Data Science: A Managerial Perspective*. 4th edn. Pearson.
- Siemens, G. (2013) 'Learning analytics: the emergence of a discipline', *American Behavioral Scientist*, 57(10), pp. 1380–1400. doi: 10.1177/0002764213498851.
- Slade, S. and Tait, A. (2019) *Global guidelines: Ethics in Learning Analytics*. Available at: https://gallery.mailchimp.com/2c137fb8d5b2c00e44c649471/files/fe776a62-826b-4234-9b53-1c1098161e4a/Global_guidelines_for_Ethics_in_Learning_Analytics_Web_ready_March_2019.pdf.
- Wilson, A. et al. (2017) 'Learning analytics: challenges and limitations', *Teaching in Higher Education*, 22(8), pp. 991–1007. doi: 10.1080/13562517.2017.1332026.
- Wong, A., Lavrencic, M. and Khosravi, H. (2017) *An Overview of Learning Analytics in Higher Education*, Institute for Teaching and Learning Innovation, The University of Queensland.
- Zilvinskis, J., Willis, J. and Borden, V. M. H. (2017) 'An overview of Learning Analytics', *New Directions for Higher Education*, 2017(179), pp. 9–17. doi: 10.1002/he.202239.